Paper No. 21

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte RUDOLPH R. M. MULLER

Appeal No. 2001-2235
Application No. 08/699,660

ON BRIEF

Before GARRIS, TIMM, and MOORE, *Administrative Patent Judges*.

TIMM, *Administrative Patent Judge*.

DECISION ON APPEAL

This appeal involves claims 1-25 which are all the claims pending in the application. We have jurisdiction under 35 U.S.C. § 134.

THE CLAIMED INVENTION

Appellant's invention relates to a method of forming a temporary seal in the bore of a fastener. The temporary seal serves to protect the bore during further processing, such as during sand blasting or painting, but can be removed from the bore by, for example, threading a stud into the bore (Brief[1] at 2). Claim 1 is illustrative:

1. A method of sealing a bore opening in a fastener member, comprising the following steps:

a. supporting a sealing element in said bore opening, said sealing element being heat softenable and plastically deformable, said sealing element having a diameter less than said bore opening;

b. heating said sealing element to a heat softened plastically deformable temperature at which temperature said sealing element softens and is deformable, but said temperature is below the melting temperature of said sealing element;

c. mechanically deforming said sealing element radially outwardly into a mechanical interlocking engagement with said bore opening at said heat softened plastically deformable temperature; and

d. cooling said sealing element below said heat softened plastically deformable temperature, said sealing element then sealing said fastener member bore opening.

[1]All reference to the Brief is to the Brief recorded as Paper No. 15.

THE EVIDENCE

As evidence of unpatentability, the Examiner relies upon the following prior art references:

Villo	3,093,177	June 11, 1963
Knowlton	3,121,129	Feb. 11, 1964
Knowlton	3,270,610	Sep. 6, 1966
Shinjo	3,797,547	Mar. 19, 1974
Stol	4,514,125	Apr. 30, 1985
Higgins	4,729,705	Mar. 8, 1988
Hughes	5,133,630	July 28, 1992

THE REJECTIONS

All the claims stand rejected under 35 U.S.C. § 103(a) as follows:

1. Claims 1-10 stand rejected over Knowlton ‘610 in view of Villo.

2. Claims 11-13 stand rejected over Knowlton ‘610 in view of Hughes.

3. Claim 14 stands rejected over Knowlton ‘610 in view of Hughes and further in view of Stol.

4. Claims 15 and 16 stand rejected over Knowlton ‘610 in view of Hughes and Stol and further in view of Higgins.

5. Claim 17 stands rejected over Knowlton ‘610 in view of Stol.

6. Claim 18 stands rejected over Knowlton ‘610 in view of Stol and further in view of Hughes.

7. Claim 19 stands rejected over Knowlton ‘610 in view of Stol and Hughes and further in view of Higgins.

8. Claims 20-23 stand rejected over Knowlton ‘610 in view of Shinjo.

9. Claims 24 and 25 stand rejected over Knowlton '610 in view of Shinjo and further in view of Hughes.

10. Claims 11-13 stand rejected over Knowlton '129 in view of Hughes.

11. Claims 20-23 stand rejected over Knowlton '129 in view of Shinjo.

12. Clams 24 and 25 stand rejected over Knowlton '129 in view of Shinjo and further in view of Hughes.

We reverse with respect to all of the rejections for the reasons that follow.

OPINION

A rejection based on § 103(a) clearly must rest on a factual basis grounded in the prior art. The Examiner has the initial duty of supplying the factual basis for the rejection. *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). Any deficiencies in the factual basis may not be filled using speculation, unfounded assumptions or hindsight reconstruction. *In re Warner*, 379 F.2d 1011, 1017, 154 USPQ 173, 178 (CCPA 1967).

Claims 1-20 are all directed to a method of sealing a bore wherein the sealing element is "heat softenable and plastically deformable." These claims further require steps of heating the sealing element to a "heat softened plastically deformable temperature" which is below the melting temperature of the sealing element and mechanically deforming the sealing element at that temperature.

Knowlton ‘610 describes a process of sealing a bore by placing a fastener over a pellet on a conveyor belt and heating to cause expansion of the pellet against the walls of the bore of the fastener (Knowlton ‘610 at col. 1, l. 62 to col. 2, l. 10). To be “heat softenable and plastically deformable,” a material must become softer when heated such that it can be reshaped without rupture. Knowlton ‘610 employs a sealing element made from a thermo-expansible material such as foam vinyl tape or epoxy (Knowlton ‘610 at col. 2, ll. 11-16). Epoxies are normally thermosetting polymers. Thermosetting polymers do not soften upon heating. Nor is it clear what one of ordinary skill in the art would have understood “foam vinyl tape” to mean. While the Examiner finds that “[t]he pellet may be vinyl foam which can be a thermoplastic polymer” (Answer at 4), Appellant, on the other hand, states that “a foam vinyl pellet is not thermo-plastic.” (Brief at 11). The facts on the record fall short of establishing that one of ordinary skill in the art would have selected a thermoplastic vinyl for use in the foam tape of Knowlton ‘610, particularly in view of the fact that epoxy is also a suggested material. Nor can we rely on the fact that claim 2 of Knowlton uses the terminology “foam plastic pellet” (col. 4, ll. 15). The term “plastic” is often used in the art to refer to thermosetting as well as thermoplastic polymers. The facts are insufficient to establish that one of ordinary skill in the art would have heated a heat softenable plastically deformable pellet to a heat softened plastically deformable temperature in the process of Knowlton ‘610.

To reject claims 1-10, the Examiner combines Villo with Knowlton ‘610. Villo describes the formation of a thread lock by bonding a pellet 13 of plastic, such as polyamide, to a minor

portion of the thread area of, for instance, a bolt (Villo at Fig. 1). In a preferred embodiment, Villo presses the pellet onto a heated threaded work element 32 by means of plunger 34 so that the pellet deforms into the threads (Villo at col. 4, l. 50 to col. 5, l. 16; Figs. 8-10). The Examiner concludes that it would have been obvious to one of ordinary skill in the art to have used a heated male element in the method of Knowlton instead of heating in an oven to expand the pellet of Knowlton because Villo teaches that heating by use of a ram enhances bonding of the pellet material to the threaded surfaces (Answer at 6).

The Examiner has not provided a convincing reason, suggestion, or motivation to combine the teachings of Knowlton '610 and Villo in such a way as to lead one of ordinary skill in the art to the process of claim 1. In the embodiment relied upon by the Examiner, Villo heats the threaded element 32 to facilitate bonding of the pellet to the threads. Heating the threaded element would be akin to heating the female threaded fastener of Knowlton to bond the pellet to the threads of the female fastener. There is no suggestion of heating a ram as suggested by the Examiner. Furthermore, Villo heats the threaded element to a temperature above the melting point of the thermoplastic polyamide. There is no suggestion in Villo of heating to "a heat softened plastically deformable temperature ... below the melting temperature of the sealing element" as claimed. At best, the combination suggests heating the female fastener of Knowlton '610 to a temperature above the melting temperature and using a ram to push the pellet into engagement with the threads on the female fastener. However, this is not what is claimed nor it is clear that there would have been a reasonable expectation that bonding would be enhanced as

suggested by the Examiner. The material of Knowlton '610 is of a different nature than that of Villo, i.e. thermoplastic polyamide versus heat expandible material.

We conclude that the Examiner has failed to establish a *prima facie* case of obviousness with respect to the subject matter of claims 1-10.

Claims 11-13 are rejected over Knowlton '610 in view of Hughes. As explained above, the evidence is insufficient to show that Knowlton '610 would suggest to one of ordinary skill in the art a process of using a heat softenable and plastically deformable polymer which is heated and deformed as claimed.

Moreover, we are not convinced that one of ordinary skill in the art would have combined the teachings of Knowlton '610 and Hughes as suggested by the Examiner. According to the Examiner, one of ordinary skill in the art would have heated the fastener of Knowlton '610 because Hughes teaches that heating the fastener reduces drive torque and enhances the flow of thermoplastic materials. But the material of Knowlton '610 is a thermo-expansible material such as vinyl foam tape or epoxy. The Examiner has failed to convince us that Knowlton '610 suggests using a thermoplastic. Nor is it clear that one of ordinary skill in the art would reasonably expect to obtain the same benefits when heating the fastener inserted into the pellet of Knowlton. Hughes inserts a fastener into a large thermoplastic workpiece.

We conclude that the Examiner has failed to establish a *prima facie* case of obviousness over Knowlton '610 in view of Hughes with respect to the subject matter of claims 11-13.

Claims 11-13 are also rejected over Knowlton '129 in view of Hughes. The sealing element of Knowlton '129 is not heat softenable and plastically deformable, it is a liquid curable plastic material such as a plastisol (Knowlton '129 at col. 2, l. 1). This material gels (col. 2, l. 5) and expands upon curing (col. 2, ll. 15-17), it does not soften and plastically deform upon heating. Moreover, the material is not mechanically deformed, but expands into the threads. Heating the fastener, as described by Hughes, would not reduce torque nor increase flow because the material of Knowlton '129 is not thermoplastic, but a cured material. The Examiner has failed to present a convincing reason to make the combination such as to result in the claimed invention.

We conclude that the Examiner has failed to establish a *prima facie* case of obviousness with respect to the subject matter of claims 11-13. None of the additionally applied references cure the deficiencies discussed above. Therefore, rejections of the other dependent claims, claims 14-20, fall as well.

Claims 20-23 are rejected over either Knowlton '610 or Knowlton '129 in view of Shinjo. all of these claims require the sealing of both ends of a generally tubular fastener element. In addition to sealing the threaded end with a deformable sealing element, the other end is sealed with a metal disk. Neither of the Knowlton references nor Shinjo describes sealing a metal disk in the free end of a fastener element. The insert of Shinjo is not a metal disk but a resilient insert with an aperture in the center. In order to establish a *prima facie* case of obviousness, the Examiner must show that each and every limitation of the claim is described or suggested by

the combination of prior art references or would have been obvious based on the knowledge of those of ordinary skill in the art. *In re Fine*, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). The Examiner has not made such a showing in this case.

We conclude that the Examiner has failed to establish a *prima facie* case of obviousness with respect to the subject matter of claims 20-23. Huges does not cure the deficiencies discussed above. Therefore, the Examiner has failed to establish a *prima facie* case of obviousness with respect to the subject matter of claims 24 and 25 as well.

CONCLUSION

To summarize, the decision of the Examiner to reject claims 1-25 under 35 U.S.C. § 103(a) is reversed.

REVERSED

BRADLEY R. GARRIS Administrative Patent Judge	)
CATHERINE TIMM Administrative Patent Judge	) BOARD OF PATENT) APPEALS) AND) INTERFERENCES
JAMES T. MOORE Administrative Patent Judge	)

CT/jg

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